

COUNTY OF SAN DIEGO
REPORT FORMAT AND CONTENT REQUIREMENTS

NOISE



LAND USE AND ENVIRONMENT GROUP

Department of Planning and Land Use
Department of Public Works

March 19, 2007

PURPOSE

The Noise Report Format and Content Requirements provide guidance on conducting noise assessment and preparing reports for discretionary projects being processed by the Land Use and Environment Group. These guidelines are designed to:

1. Ensure the quality, accuracy and completeness of noise impact reports.
2. Aid in staff's efficient and consistent review of maps and documents from different consultants.
3. Provide adequate information to make appropriate planning decisions and to make determinations regarding conformance with applicable regulations.
4. Increase the efficiency of the environmental review process and avoid unnecessary time delays.

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1.0 INTRODUCTION

All noise assessment shall follow the requirements in this document. The overall length of reports and amount of information to include will vary depending on the size and scope of the project, the regional setting, and the degree of impacts proposed.

1.1 Acoustical Analysis Report

An Acoustical Analysis Report is required for projects with potential significant noise impacts.

2.0 REPORT FORMAT AND REQUIREMENTS

2.1 General Report Guidelines

All written reports shall follow these general guidelines:

- Reports should be technical in nature and should avoid anecdotal or extraneous information.
- Reports should be concise and written in a professional manner suitable for peer review. Staff may reject reports based on inadequate quality if the report is written in such a manner that a timely and accurate review cannot be completed.
- Acoustical reports should be bound such that staff may easily review the document. Shorter reports may be stapled, but longer documents should be bound by other methods, such as comb binding.
- Attached plot plans must be to scale and contain a north arrow and both number and bar scales. When maps are reduced, adjust the scale, or mark the map "Reduced/Use Bar Scale".
- For Full Acoustical Analysis Reports, each chapter and subsection of the report should be clearly delineated with bold print and/or underlining and will use the numerical headings contained in these report requirements.
- Draft copies of the report shall have all changes made in response to staff comments in strikeout/underline form. Final copies of the report shall be clean, with all editing marks removed.

All acoustical reports will be reviewed for technical accuracy and completeness by a staff noise specialist. Reports are considered draft until staff determines the report to be complete. Each submittal and review of a draft noise report is considered an "iteration". During each iteration, staff will either determine the report to be complete or respond with comments for necessary changes. The County expects that the first iteration will be as complete and comprehensive as possible to address issues in the scoping letter. However, each report may have up to three iterations, after which project denial may be recommended due to inadequate environmental progress.

2.2 Acoustical Analysis Report

2.2.1 Outline

The required sections of the Full Acoustical Report are provided in the outline below:

ACOUSTICAL ANALYSIS REPORT OUTLINE

COVER PAGE

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APPENDICES	
	<ul style="list-style-type: none">• References• Sound Modeling Application Input/Output Data

2.2.2 Content

Note: The numbering identified below should be used when preparing technical studies. The numbers and titles are shown in italics only for purposes of this document and are not required to be formatted in italics for the technical study.

COVER PAGE

The cover page shall include the following information:

- Project common name
- Project numbers (i.e. TM, ZAP, MUP, etc.) including the environmental log number (ER)
- Date (original report date plus all revisions) must be revised during each iteration of the draft report
- Name of County Approved CEQA Consultant preparing document, firm name (if applicable) and address
- Project proponent's name and address
- The following statement: Prepared for The County of San Diego

TABLE OF CONTENTS

The table of contents must follow the order and format outlined in this document. Page number should be assigned when possible. Titles of each Appendix or Attachment should be listed in the order in which they are found in the document.

GLOSSARY OF TERMS AND ACRONYMS

Provide a list of terms and acronyms used in the report.

EXECUTIVE SUMMARY

Provide a brief summary of the project, the noise sources present on the site, potential impacts and proposed mitigation. No information should be provided in the summary that is not further explained elsewhere in the document. The purpose of the summary is to provide a quick reference for the public and decision makers. Therefore, the language should be less technical than that used in the remainder of the document.

1.0 INTRODUCTION

1.1 Project Location and Description

Project Location: Discuss the project location in the regional and local context. Include Global Positioning System (GPS), San Diego Association of Governments (SANDAG) or most current mapping coordinates used by San Diego Geographic Information System (SANGIS) with the site and APN clearly identified as numbered figure(s).

For SANDAG GIS Projection/Coordinate System information, refer to SANDAG website:

<http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome>

Project Description: Provide a very detailed description of the project, including all on-site and off-site components and any design alternatives. An 8.5" x 11" or 11" x 17" copy of the plot plan/map must be attached to the report as (a) numbered figure(s). The project description should be as detailed as possible, including details such as but not limited to the following:

- Size of project site and area proposed for development.
- Description of all adjoining land uses.
- Purpose and scale of proposed uses associated with the project, such as residential development or recreational camping.
- Proposed structures (size, location, purpose, etc.).
- Location of all easements relevant to the noise assessment.
- Proposed Noise Sensitive Land Uses (NSLUs), exposed to noise sources.
- Construction equipment activities and staging areas.

1.2 Applicable Noise Regulations and Standards

Briefly detail the County, State and Federal environmental regulations that apply to the project.

1.3 Environmental Settings & Existing Conditions

1.3.1 Settings & Locations

Describe the physical characteristics, such as topography, elevation, etc. Briefly describe the general vicinity in terms of type and density of development and infrastructure. In addition, address the existing land uses on site, on surrounding lands and activities.

1.3.2 Existing Noise Conditions

Discuss existing noise conditions. Describe the location of the project site, identifying existing noise associated with project related to the following:

- Existing noise from all sources, particularly roads, highways, railroads, airports, heliports, extractive industries or any significant on- and off-site noise impacts.
- Existing operation activities including but not limited to: mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, generators, pneumatic equipment and outdoor human activities.
- Existing construction activities including but not limited to: site grading, truck/construction equipment movement, engine noise, rock excavation, crushing, and blasting.

1.4 Methodology and Equipment

1.4.1 Noise Measuring Methodology and Procedures

Identify and list all types of noise measuring and project related equipment involved in the analysis. Receptor locations will be located at any point on and/or beyond the boundaries of the property line (section 36.404). Existing and proposed NSLUs shall be identified and modeled (Policy 4B). Exterior locations shall be identified as contiguous areas to the building structure, with related accessibility. The outdoor living area shall be adjoined, on the same lot as the dwelling unit, and will conform to setbacks and relevant ordinances. Receptors shall be located at the most optimal location based on access, privacy and relevant County Standards. This section will also discuss field calibration. Document any calibration calculations that were necessary to validate noise model. Ground-borne vibration assessment is to be identified in inches per second rms.

In addition, noise measurements and analysis shall be documented to the effect that all procedures are in compliance with the most current American Society for Testing and Materials (ASTM) standards or other applicable standards.

SOUND LEVEL MEASUREMENT (Excerpt from Section 36.403)

- Any sound or noise level measurement made pursuant to the provisions of this ordinance shall be measured with a sound level meter using the A-weighting and "slow" response pursuant to applicable manufacturer's instructions.
- The sound level meter shall be appropriately calibrated and adjusted as necessary by means of an acoustical calibrator of the

coupler-type to assure meter accuracy within the tolerances set forth in American National Standards ANSI-SI. 4-1971 or the latest revision thereof.

- For outside measurements, the microphone shall be not less than four feet above the ground, at least four feet distant from walls or other large reflecting surfaces and shall be protected from the effects of wind noises by the use of appropriate wind screens and the location selected shall be at any point on the affected property. In cases when the microphone must be located within ten feet of walls or similar large reflecting surfaces, the actual measured distances and orientation of sources, microphone and reflecting surfaces shall be noted and recorded. In no case shall a noise measurement be taken within five feet of the noise source.
- For inside measurements, the microphone shall be at least three feet distant from any wall, ceiling or partition, and the average measurement of at least three microphone positions throughout the room shall be determined.

1.4.2 Noise Modeling Software

Discuss the noise modeling application in the report. Input data and results shall be submitted in a form in which Staff is able to verify with in-house programs. Noise assessment utilizing proprietary noise models and propriety software will only be acceptable when accompanied by theoretical calculations. Provide a discussion of the two methods of analysis, addressing and comparing the results. For more proprietary model information refer to Section 1.4.2.1.

Traffic Noise Prediction Model-Sound 32, Traffic Noise Model-TNM 2.5 and the most current transportation noise modeling software that is available to the County are considered acceptable noise modeling applications. Other proprietary models are considered additional, supplemental information supporting actual and theoretical noise assessment and calculations. Staff may request additional information such as noise assessment in a certain form, visual illustrations, etc.

Proprietary Models

In order for the County of San Diego to allow the use of noise models which are not open source or provided by a public agency, such as “Cadna”, certain criteria must be met. Since proprietary models are not made available to the County for use, the County must rely on certain assumptions regarding the model, its application, and the validity of the modeling results. It will be necessary for staff to run its own analysis for a given project. This analysis allows staff to verify that the project complies with applicable noise ordinance and noise element requirements based on

the unmitigated noise levels of all noise generators on the property site. This analysis may also eliminate the need to examine the proprietary model results since the available source information for this project (the unmitigated case) can be used to demonstrate compliance. In order to perform this preliminary evaluation, staff will need sufficient noise source specifications and location information including property line distances.

The submitted data should be presented as a comma-delimited (or Tab-Delimited) data set for each noise source, relevant noise barrier, and model receptor. The standardized data format for this information is as follows:

1. All project locations must be described using State plane coordinates, or with a Cartesian reference frame using a stated origin location;
2. All project locations must be described using State plane coordinates, or with a Cartesian reference frame using a stated origin location;
3. All noise sources or generators shall require two files for describing their noise performance information and their location information. Each source will be linked in these files with a unique integer identification number. The noise performance file shall list each generator beginning with the ID number followed by its octave band information in a comma-delimited format starting with the 63 Hertz band and extending up to at least the 8000 Hertz band (16K is preferred). Unless it is otherwise specified, the decibel values shall be stated for each band with A-weighting included. A separate header/line entry or explanation would be required for an alternate format such as one-third octave bands or raw sound level values. The noise generator or source location file must use a matching integer identification number for each source in a comma-delimited format: generator1_id, x_coordinate, y_coordinate, z_coordinate (elevation of the source). One generator per line (entry);
4. The noise barrier or feature file must use a unique integer identification number for each feature in a comma-delimited format for vertices: barrier1_id, x_coordinate, y_coordinate, z0_coordinate (base of feature elevation), z1_coordinate (top of feature elevation). One vertex or node per line (entry); and
5. The model receptor file with a unique integer identification number must be given to each receptor in a comma-delimited format: receptor1_id, x_coordinate, y_coordinate, z_coordinate (elevation of the receptor), with one receptor per line (entry). Please note that an expanded receptor file may be required at complex sites.

1.4.3 Noise Calculations

Demonstrate the calculations and procedures used in the noise assessment. Discuss theoretical and measured calculations that may apply. This section will discuss calculations such as barrier attenuation loss, attenuation by distance, etc.

2.0 NOISE SENSITIVE LAND USES (NSLUs)

2.1 Guidelines for the Determination of Significance (Excerpt from Section 4.1)

Project implementation will result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated from the project, together with noise from roads [existing and planned], railroads, airports, heliports and all other noise sources) in excess of any of the following:

A. Exterior Locations:

- i. 60 dB (CNEL); or*
- ii. An increase of 10 dB (CNEL) over pre-existing noise.*

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- | | |
|---|-----------------------------------|
| <i>(1) Net lot area up to 4,000 square feet:</i> | <i>400 square feet</i> |
| <i>(2) Net lot area 4,000 square feet to 10 acres:</i> | <i>10% of net lot area</i> |
| <i>(3) Net lot area over 10 acres :</i> | <i>1 acre</i> |

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

- i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 decibels (A).*
- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.*

2.2 Potential Noise Impacts

Discuss the exposure of NSLU receptors to potential noise from all sources particularly roads, highways, railroads, airports, heliports or extractive industries (Transportation and Non-transportation). This includes noise caused by new development impacting existing or foreseeable future NSLUs. It also includes new development which creates or locates NSLUs in such a place that they are impacted by noise (a typical example being a new residential project locating residences in close proximity to a highway).

a. *Potential Build Out Noise Conditions*

Discuss potential buildout noise conditions. Noise-related adverse effects associated with new development projects fall into the following category:

- Noise Sensitive Land Uses (NSLUs) – Exposure of NSLUs to potential noise from all sources, particularly roads, highways, railroads, airports, heliports or extractive industries. This includes noise caused by new development, impacting existing or foreseeable future NSLUs. It also includes new development which creates or locates NSLUs in such a place that they are impacted by noise (a typical example being a new residential project locating residences in close proximity to a highway). A table shall include potential noise sources that are modeled in the analysis:

Table X.X Sample Roadway Potential ADTs

Roadway / Highway/ Noise Source Name	Potential Speed Limit	Potential ADTs

b. *Potential Noise Impact Identification*

- Model noise sensitive receptors at strategic NSLU locations to help determine the worse-case scenario. Identify all receptor locations and their values.

Table X.X Sample Potential Traffic Noise Impacts

Receptor Number	Receptor Location	Elevation	Potential Traffic Noise Level (CNEL)

c. *Design Considerations*

- Identify all existing topographic elements that are modeled in the noise analysis.

2.3 **Mitigated Noise Impacts**

If potential noise level impacts to NSLUs are determined to be significant:

a. Mitigation Measurement Calculations

- Discuss modifications to the development that have been made or will be made which reduce the noise sensitive receptors to a noise level below CNEL equal to 60 decibels
- Provide mitigation measures to reduce potential noise impacts. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation.
- Determine whether mitigation or design is feasible to adequately reduce noise levels to meet County Standards.

Table X.X Sample Potential Mitigated Traffic Noise Impacts

Receptor Number	Receptor Location	Elevation	Mitigation	Mitigated Traffic Noise Level (CNEL)

b. Design Consideration Calculations

- Discuss modifications to the development that have been made or will be made which reduce the exterior noise level below CNEL equal to 60 decibels
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

2.4 **Cumulative Noise Impacts (If applicable)**

Cumulative noise impacts may occur in discretionary applications where other permitted or planned projects will combine to exceed the standards of the Noise Element. It is more likely to occur in locations where existing noise levels are elevated or approach the applicable criterion of 60 decibels CNEL for an exterior noise sensitive land use (NSLU). Two examples of cumulative effects are (1) major residential developments in a region generate sufficient project-related traffic to affect significantly existing or planned NSLU and (2) extractive industries or long-term construction activities from several projects are in close proximity to existing or planned NSLU with future conditions exceeding 60 decibels CNEL. It may also be considered a significant cumulative impact when new projects combine to generate more than double the existing sound energy of a documented noisy site. With an identified significant cumulative impact, the

analysis also needs to determine whether the project's contribution is "cumulatively considerable" before addressing the issue of feasible mitigation measures. Mitigation measures are then proposed to reduce these potential impacts and to evaluate their feasibility and limitations associated with their implementation.

Currently, a "cumulatively considerable" contribution requiring mitigation or design measures is identified whenever (1) more than 50 percent of the change can be attributed to the project or (2) more than a one decibel increase from the project was identified in the model analysis. A major project issue for cumulative noise effects can be identified whenever there is no supporting evidence that (1) the surrounding community would consent to a proposed off-site mitigation scheme or (2) the feasible measures (on or off-site) are not sufficient to comply with the Noise Element.

2.5 Conclusions

This section shall discuss and identify significant noise impacts. For each significant impact, determine if the proposed mitigation measures have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

3.0 OPERATION ACTIVITIES

3.1 Guidelines for the Determination of Significance (Table 2 from Section 4.2)

It shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits on Table 2.

The project will generate airborne noise which, together with noise from all sources, will be in excess of either of the following:

Table 2
San Diego County Code Section 36.404, Sound Level Limits

ZONE		APPLICABLE LIMIT ONE-HOUR AVERAGE SOUND LEVEL (DECIBELS)
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5. Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
S-94, V4, and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
M-50, M-52, M-54	Anytime	70
S-82, M-58, and all other industrial zones.	Anytime	75

If the measured ambient level exceeds the applicable limit noted above, the allowable one hour average sound level shall be the ambient noise level. The ambient noise level shall be measured when the alleged noise violation source is not operating.

The sound level limit at a location on a boundary between two (2) zoning districts is the arithmetic mean of the respective limits for the two districts; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone where the extractive industry is actually located.

Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of this section, measured at or beyond six (6) feet from the boundary of the easement upon which the equipment is located.

3.2 Potential Noise Impacts

Discuss exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to: mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes.

a. Potential Build Out Noise Conditions

Discuss potential buildout noise conditions. Noise-related adverse effects associated with new development projects fall into the following category:

- Operation Activities – Exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to; mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes. Provide measured Leq and octave band data.

Note: No permanent loudspeaker or sound amplification system shall be used to produce sounds in violation of the County Noise Ordinance.

Table X.X Sample Noise Generating Equipment Measurement

Noise Source Name	Distance Measured	Octave Band Data					Leq Measurement

b. Potential Noise Impact Identification

- Model noise receptors relative to the project boundaries and property lines. Receptors shall be strategically located in areas that will determine worst-case noise impacts. Identify all noise sources, receptor locations, their distance to project property lines and their values.

Table X.X Sample Attenuation by Distance Measurement

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Distance Measured	Noise Level (dBA)

c. Design Considerations

- Identify all existing topographic elements that are modeled in the noise analysis.

3.3 **Mitigated Noise Impacts**

If potential noise impacts at the project boundaries/property lines and beyond are determined to be significant:

a. Mitigation Measurement Calculations

- Discuss modifications to the development that have been made or will be made which will reduce noise impacts to the project boundaries and property line. Noise level limit thresholds at the property line will be determined by Section 4.1-Table 2.
- Provide mitigation measures to reduce potential noise impacts. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation. Noise level limit thresholds at the property line will be determined by Section 4.1-Table 2.

Table X.X Sample Mitigated Noise Impacts

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Noise Level (dBA)	Noise Mitigated Reduction

b. Design Considerations

- Discuss modifications to the development that have been made or will be made which reduce noise impacts to the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

3.4 **Cumulative or Combined Noise Impacts (If applicable)**

a. Potential Noise Impact Identification

- Discuss co-location project exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to; mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes.
- Identify cumulative or combined noise impacts from both existing and potential noise impacts. Specify whether the project proposes significant contributions to the existing noise conditions.

Table X.X Sample of Cumulative or Combined Noise Impacts

Receptor Label	Receptor (Property Line) Location	Noise Source (name) & Leq	Noise Source (name) & Leq	Noise Source (name) & Leq	Cumulative or Combined Noise Level Impacts

b. Mitigation Measurement Calculations

If the proposed potential noise impacts are determined to have a significant contribution to the existing noise conditions, mitigation measures shall be provided.

- Provide mitigation measures to reduce potential noise impact contributions. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation. Noise level limit thresholds at the property line will be determined by Section 4.1-Table 2.

c. Design Considerations

- Identify all existing topographic elements that are modeled in the noise analysis.
- Discuss modifications to the development that have been made or will be made which reduce noise impacts at the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

3.5 Conclusions

This section shall discuss and identify significant noise impacts. For each significant impact, determine if the proposed mitigation measures have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

4.0 CONSTRUCTION ACTIVITIES

4.1 Guidelines for the Determination of Significance

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Section 36.410, Construction Equipment.

Section 36.410 states:

Except for emergency work,

- (a) It shall be unlawful for any person to operate construction equipment between the hours of 7 p.m. of any day and 7 a.m. of the following day.
- (b) It shall also be unlawful for any person to operate construction equipment on Sundays, and days appointed by the President, Governor, or the Board of Supervisors for a public fast, Thanksgiving, or holiday, but a person may operate construction equipment on the above-specified days between the hours of 10 a.m. and 5 p.m. at his residence or for the purpose of constructing a residence for himself, provided that the average sound level does not exceed 75 decibels during the period of operation and that the operation of construction equipment is not carried out for profit or livelihood.
- (c) It shall also be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property upon which a legal dwelling unit is located an average sound level greater than 75 decibels between the hours of 7 a.m. and 7 p.m.

For temporary activities, the County considers the 75 decibel (A) average to be based on a period of one hour.

4.2 Potential Noise Impacts

Exposure of on- or off- site areas to noise associated with project-related construction activities including but not limited to: site grading, truck/construction equipment movement, engine noise, rock excavation, crushing, and blasting.

a. Potential Build Out Noise Conditions

Discuss potential buildout noise conditions. Noise-related adverse effects associated with new development projects fall into the following category:

- Construction Activities – Exposure of on- or off- site areas to noise associated with project-related construction activities including but not limited to: site grading, truck/construction equipment movement, engine noise, rock excavation, crushing, breaking and blasting.

Table X.X Sample Construction Equipment Noise

Noise Source Name	Noise Source Elevations	Distance Measured	Duty Cycle	Noise Levels

Include additional columns and items to all tables that apply. Provide any additional information that will assist Staff in verifying data.

b. Potential Noise Impact Identification

- Model noise receptors relative to the project boundaries and property lines. Receptors shall be strategically located in areas that will determine worst-case noise impacts. Identify all noise sources, receptor locations, and their distance to project property lines, duty cycle and their values.

Table X.X Sample Construction Equipment Noise

Noise Source Name	Noise Source Elevations	Receptor Location	Distance Measured	Duty Cycle	Noise Levels

c. Design Considerations

- Identify all existing topographic elements that are modeled in the noise analysis.

4.3 Mitigated Noise Impacts

If potential noise impacts at the project boundaries/property lines and beyond are determined to be significant:

a. Mitigation Measures

- Discuss modifications to the development that have been made or will be made which will reduce noise impacts at the project boundaries and property line. Noise level limit thresholds at the property line will be determined by Section 5.1 (Section 36.410 in the Noise Ordinance.)
- Provide mitigation measures to reduce potential noise impacts. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation. Noise

level limit thresholds at the property line will be determined by Section 5.1 (Section 36.410 in the Noise Ordinance.)

Table X.X Sample Mitigated Construction Equipment Noise

Noise Source Name	Noise Source Elevations	Receptor Location	Distance Measured	Duty Cycle	Noise Levels

b. Design Considerations

- Discuss modifications to the development that have been made or will be made which reduce noise impacts at the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

4.4 Cumulative or Combined Noise Impacts (If applicable)

Use if applicable.

4.5 Conclusions

This section shall discuss and identify significant noise impacts. For each significant impact, determine if the proposed mitigation measures have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

5.0 GROUND-BORNE VIBRATION AND NOISE IMPACTS

5.1 Guidelines for the Determination of Significance

Project implementation will expose the uses listed in Table 3 and 4 to ground-borne vibration or noise levels equal to or in excess of the levels shown:

Table 3
Guidelines for Determining the Significance of
Groundborne Vibration and Noise Impacts

Land Use Category	Ground-Borne Vibration Impact Levels (inches/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Infrequent Events ²	Frequent Events ¹	Infrequent Events ²
Category 1: Buildings where low ambient vibration is essential for interior operations. (research & manufacturing facilities with special vibration constraints)	0.0018 ³	0.0018 ³	Not applicable ⁵	Not applicable ⁵
Category 2: Residences and buildings where people normally sleep. (hotels, hospitals, residences, & other sleeping facilities)	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use. (schools, churches, libraries, other institutions, & quiet offices)	0.0056	0.014	40 dBA	48 dBA

Source: U.S Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes to Table 3:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.
5. There are some buildings, such as concert halls, TV and recording studios, and theaters, that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 4 gives criteria for acceptable levels of ground-borne vibration and noise for these various types of special uses.
6. For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds one inch per second. Continuous or frequent intermittent vibration sources such as impact pile drivers are significant when their PPV exceeds 0.1 inch per second. . More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County.

Table 4
Guidelines for Determining Significance of
Ground-Borne Vibration and Noise Impacts for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (inches/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Infrequent Events ²	Frequent Events ¹	Infrequent Events ²
Concert Halls, TV Studios, and Recording Studios	0.0018	0.0018	25dBA	25dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Source: U.S Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes to Table 4:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. If the building will rarely be occupied when the trains are operating, there is no need to consider impact.
4. For historic buildings and ruins, the allowable upper limit for continuous vibration to structures is identified to be 0.056 inches/second rms. Transient conditions (single-event) would be limited to approximately twice the continuous acceptable value.

5.2 Potential & Mitigated Noise Impacts

Determine worst case vibration and/or noise impacts to the proposed project. If impacts are considered significant, provide mitigation measures to ensure project is in compliance with County Standards.

5.3 Conclusions

This section shall discuss and identify significant noise impacts. For each significant impact, determine if the proposed mitigation measures have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

6.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS

This section shall provide a brief text summary of project impacts and mitigation.

7.0 LIST OF MITIGATION MEASURES AND DESIGN CONSIDERATIONS

This section shall list any and all recommended mitigation measures and design considerations that reduce potential noise level impacts.

8.0 CERTIFICATION

This section shall provide a list of preparers, persons and organizations involved with the noise assessment. A signature from an approved County Consultant shall be provided as project certification.

FIGURES, EXHIBITS & ILLUSTRATIONS (11"x17" sized sheet shall be utilized if 8"x 11" illustrations are unclear)

Identify Project Location

Identify NSLUs & Receptor Locations

Identify All Noise Sources

Identify All Recommended Mitigation measures

(If Applicable) Identify Potential CNEL Noise contours without proposed project

APPENDICES

References

Sound Modeling Application Input/Output Data

[Attachment A]

[Noise Analysis Title] Report

Project Common Name
Permit Numbers/DPLU Environmental Log No.

Lead Agency:

County of San Diego
Department of Planning and Land Use
Contact:_____
5201 Ruffin Road, Suite B
San Diego, CA 92123
Phone Number

Preparer:

Name
Firm Name
Address
Phone Number

Signature

Project Proponent:

Name
Firm Name
Address

Date